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ABSTRACT OF THE DISCLOSURE

METHOD AND APPARATUS TO MANAGE INDEPENDENT MEMORY SYSTEMS AS A SHARED VOLUME

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A switched architecture is provided to allow controllers to manage physically independent memory systems as a single, large memory system. The switched architecture includes a path between switches of controllers for inter-controller access to memory systems and input/output interfaces in a redundant controller environment. Controller memory systems are

10   physically independent of each other; however, they are logically managed as a single, large memory pool. Cache coherency is concurrently maintained by both controllers through a shared locking mechanism. Volume Logical Block Address extents or individual cache blocks can be locked for either shared or exclusive access by either controller. There is no strict ownership model to determine data access. Access is managed by the controller in the pair that receives the

15   access request. When a controller is removed or fails, a surviving controller may take appropriate action to invalidate all cache data that physically resides in the failed or missing controller's memory systems. Cached write data may be mirrored between redundant controllers to prevent a single point of failure with respect to unwritten cached write data.